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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KATZ, VERA

ART UNIT

PAPER NUMBER

1784

MAIL DATE

DELIVERY MODE

02/25/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/572,770	Applicant(s) BAYER ET AL.	
	Examiner Vera Katz	Art Unit 1784	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20,21,24-32,34-39,46 and 47 is/are pending in the application.
- 4a) Of the above claim(s) 31,32,34-37 and 39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-21, 24-30, 38 and 46-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/01/11 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 20-21, 24-28, 30 and 38 and 46-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Schaeffer (5783315) as evidenced by Rigney (20020094448).

Considering claims 20-21, 24, 28, 30 and 38, Schaeffer teaches a gas turbine component; [Fig.1], or a coating resistant to environmental damage for gas turbine engine and therefore, considered to be wear protection or erosion protection coating;

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[col. 1, lines 37-39 and col. 2, lines 42-46]. However, regarding the recitation “wear protection coating which is applied to a to-be protected surface of a flow mechanically stressed component”, this recitation has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Thus, the surface 31 of the substrate 32 the coating is applied to is considered to be protected surface of a mechanically stressed component.

Schaeffer further teaches a double layer structure 30 wherein the first layer 36 is applied directly to the surface 31 and a second layer 38 applied directly to the first layer 36 forms an outer cover coat; [Fig. 2B]. The first layer comprises the same or similar components as that of the substrate, and therefore is considered to be adapted to a material composition of the component; [col. 4, lines 1-30]. However, little patentable weight has been given to the claim language “adapted to” as no limiting effect is required in the claims, see MPEP 2111.04.

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The first layer is applied by plasma spray. As evidenced by Rigney, the plasma spray technique provides porous coatings; [0006] therefore pores are considered to be disposed within the first layer. Schaeffer also teaches that by varying chromium content in the first layer the density and the hardness of the layer can be decreased; [col. 4, line 55-58 and col. 5, lines 5-6]. The teaching of decreasing the density is equivalent to the teaching of increasing porosity of the first layer; the aforesaid teaching is considered to meet the recitation of "pores disposed within the first layer". The new recitation of claims 20 and 38 "the pores are formed by evaporated additive to a material of the first layer" is considered to be a process step with no impact on the structural limitation of claimed product. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process; (MPEP 2113). The coating that would be produced by the process step of this claim does not appear to be patentably distinct from the article of Schaeffer.

Additionally, claims 20 and 38 are drawn to the final or intermediate product, i.e. a coating and a gas turbine component, while an evaporated additive is in the precursor; the former is vaporized and does not appear to be in the final coating and therefore, does not provide any additional limitations to the intermediate or final product as there is no evaporated additive in the claimed product.

Considering claims 25-26 and 27, the substrate, or the component is a titanium alloy or titanium aluminum alloy, such as titanium aluminide; [col. 2, lines 42-44]. The

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first layer is titanium alloy, or titanium aluminum alloy; [col. 4, lines 22-30]. The component is a gas turbine blade 20; [Fig. 1]. The second layer is a ceramic layer and is considered to be relatively hard. Since the term “relatively” is not defined by the instant specification, the broadest reasonable interpretation is given to it.

Considering claims 46-47, Schaeffer teaches that the component is a gas turbine component and the coating protects from hot corrosion, oxidation, hot salt stress corrosion; the aforesaid is considered to meet the recitation of erosion protection coating; [cols. 1 and 2, lines 43-47 and 45-48, respectively].

3. Claims 20-21, 24-30, 38 and 46-47 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Bruce (20060018760), as evidenced by Rigney (20020094448). Considering claims 20-21, 23-24, 28, 30 and 38 and 46-47, Bruce teaches a gas turbine component such as a blade; [Figs.2-4], or a coating with improved impact and erosion resistance for gas turbine engine; [title, 0028]. The coating 62 is applied to a surface of a component 60. The coating 62 is formed from at least one metal layer and one ceramic layer; [0039, 0040]. The ceramic layer is the second or the outermost layer, while the metal layer is the first layer; [0040]. The first layer is directly applied to the component and the second layer is directly applied to the first layer; [0040]. The metal layer comprises materials similar to those of the first layer. Bruce teaches that the first layer is formed by PVD or EB-PVD methods; [0041]. As evidenced by Rigney, the PVD method provides a columnar structure of the coating with pores distributed within the

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columns and between the columns [Fig.4, 0006, 0019]. Therefore, the recitation of “first layer includes pores disposed within the first layer” is considered to be satisfied.

Considering new process limitation of claims 20 and 38, see explanations in the rejection section related to Schaeffer immediately above

Considering claims 25-26 and 29, the component comprises titanium aluminum alloy, such as Ti6-4 (Ti-6Al-4V); [0035]. The second layer is titanium aluminum nitride or titanium aluminum chromium nitride as representing an only group of nitrides; [0041, 0037]. Bruce further teaches that it is desirable for metal layer to comprise the same metal atoms as those in the ceramic or second layer; [0039], and further shows that the metal or the first layer is titanium aluminum alloy; [0038]. The ceramic coating is hard and the hardness is based on the ceramic layer and erosion resistance is proportional to the hardness; [0042].

4. Claims 20-21, 24-25, 27-30, 38 and 46-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Gibbs (EP0289173) as evidenced by Rigney (20020094448)..

Considering claims 20, 23-25, 28, 30 and 38 and 46-47, Gibbs teaches a wear-resistant component, such as turbine blade; [title, p. 3, line 43]. The component comprises a substrate made of titanium alloy, a first layer, immediately adjacent to the substrate comprising titanium and the surface layer, or the outer second layer on the first layer; [claim 3, p. 2, lines 16-18 and 53]. Considering the interpretation of the recited “first layer includes pores disposed within the first layer”, Gibbs teaches a deposition of the first layer by PVD technique; [p. 3, line 3], which as evidenced by

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Rigney, provides pores distributed within the layer, see explanation immediately above with regard to the deposition method resulting in the formation of pores and new limitations of claims 20 and 38.

Considering claims 27 and 29, the second layer is hard titanium nitride; [p. 2, lines 8, 16-20 and p. 4, line 43].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schaeffer (5783315) as applied to claim 20 above in view of GB 2170226. As it was shown above, Schaeffer teaches all the limitations of claim 20, but does not teach a second layer comprised of titanium nitride. GB2170226 teaches a wear-resistant coating of high hardness comprising TiN; [abstract]. It would have been obvious to one of ordinary skill in the art to provide a turbine component with a structure as taught by Schaeffer, wherein the outer, second layer is replaced by titanium nitride of GB 2170226, because Schaeffer invention is focusing on improvement of the wear resistance and GB2170226 titanium nitride coating is the best known coating for wear protection; [GB2170226, p. 1, lines 16-18].

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6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schaeffer (5783315) as applied to claim 20 above in view of Mroczkowski (4094542).

As it was shown above, Schaeffer teaches all the limitations of claim 20, but is silent about a second layer comprised of titanium nitride. Mroczkowski teaches a hard wear-resistant layer for a turbine comprising titanium nitride; [col. 3, line 10]. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a turbine component with a structure as taught by Schaeffer, wherein the outer, second layer is replaced by titanium nitride of Mroczkowski, because this modification would provide wear protection due to particle impact over a very wide range of angles of incidence; [col. 3, lines 24-26].

7. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbs (EP0289173) in view of Grunke (4094542). As it was shown above, Gibbs teaches all the features of claim 20, and also teaches a titanium alloy and aluminum in the component; [p. 2, line 53], but lacks aluminum in the first titanium layer. Grunke teaches alloying titanium with aluminum to prevent titanium to become brittle. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a turbine component with a structure and a titanium first layer, as taught by Gibbs with an aluminum addition to titanium of the first layer because the Gibbs concern is brittleness of the coatings; [p. 4, line 49, p. 2, lines 12-15] and Grunke's aluminum addition to titanium would decrease brittleness of the coating or a substrate due to delayed entry of oxygen into the component; [Grunke, col. 1, lines 30-35].

Response to Arguments

8. Applicant's arguments filed 02/01/11 in response to the Office Action dated 09/10/10 have been fully considered. In view of applicant's amendments and arguments, the applicant traverses the section 112, second paragraph rejection. The rejection is withdrawn.

9. Applicant asserts that the amended method claims now include the same "special technical feature" as that of the product claim and is a contribution over the prior art. This is not found persuasive because the same special technical feature does not provide contribution over the prior art as shown by the rejections over art above, and restriction requirements dated 02/16/10. Accordingly, claims 31-32, 34-37 and 39 are withdrawn from consideration as being directed to a non-elected invention. The requirement is still deemed proper and is therefore made FINAL.

However, upon allowance of elected product claims the rejoinder of non-elected method claims will be further considered.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vera Katz whose telephone number is (571)270-7082. The examiner can normally be reached on M - Th 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JENNIFER McNEIL can be reached on 571-272-1540. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Vera Katz/
Examiner, Art Unit 1784

/Timothy M. Speer/
Primary Examiner, Art Unit 1784